DATA REPORT

Characterization of the Levin-Richmond Terminal Corporation Berth A: Dredge Materials Sampling and Analysis Results

Episode 3

USACE: Permit 2008-00399S
RWQCB: File #: 741898 (EAC)
BCDC: M82-7 Amendment 7

Prepared for

Levin-Richmond Terminal Corporation
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Richmond, CA 94804

Prepared by

Pacific EcoRisk
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July 2012

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Ms. Debra O'Leary
U.S. Army Corps of Engineers
San Francisco District
1455 Market Street
San Francisco, CA 94103-1398

July 31, 2012

Dear Ms. O'Leary:

On behalf of Mr. Jim Cannon of the Levin-Richmond Terminal Corporation (LRTC), I have enclosed two (2) copies of the report "Characterization of the Levin-Richmond Terminal Corporation Berth A: Dredge Materials Sampling and Analysis Results." In addition, one copy of this report has been sent to each of the other DMMO participating agency representatives.

If you have any questions, please give me a call at (707) 207-7761. I look forward to hearing from you.

Sincerely,

Jeffrey Cotsifas
President

cc (w/enc): Ms. Melissa Scianni, U.S. EPA
Ms. Brenda Goeden, BCDC
Ms. Elizabeth Christian, SFRWQCB
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List of Acronyms

ASTM	American Society for Testing and Materials
Bay	San Francisco Bay
BCDC	Bay Conservation and Development Commission
Calscience	Calscience Environmental Laboratories, Inc.
COC	Chain-of-custody
CV	Coefficient-of-variation
CY	Cubic yards
DMMO	Dredged Material Management Office
DU	Dredge unit
ESC	Elutriate Suitability Concentrations
GPS	Global positioning system
HDPE	High density polyethylene
ITM	Inland Testing Manual
LRTC	Levin-Richmond Terminal Corporation
MLLW	Mean lower low water
MRL	Method reporting limits
MWP	Montezuma Wetlands Project
NUAD	Not suitable for unconfined aquatic disposal
OTM	Ocean Testing Manual
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyls
PER	Pacific EcoRisk
QA/QC	Quality assurance/quality control
RPD	Relative percent difference
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SAR	Sampling and Analysis Report
SF-DODS	San Francisco Deep Ocean Disposal Site
SFRWQCB	San Francisco Regional Water Quality Control Board
SLC	State Lands Commission
SOP	Standard operating procedures
SUAD	Suitable for unconfined aquatic disposal
TEG	TEG Oceanographic Services
TOC	Total organic carbon
USACE	U.S. Army Corps of Engineers

USEPA	U.S. Environmental Protection Agency
USFDA	U.S Food & Drug Administration
WAAS	Wide angle augmentation system
WET	Waste extraction test

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1. INTRODUCTION

Levin-Richmond Terminal Corporation (LRTC), located in the Richmond Inner Harbor Channel in Richmond, CA (Figures 1-1 through 1-3), currently maintains 10-year permits from the U.S. Army Corps of Engineers (USACE), the Bay Conservation and Development Commission (BCDC) and has applied for an Episode specific water quality certification from the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) for dredging of their Berth A. The LRTC Berth A is adjacent to the former United Heckathorn Superfund site. While the U.S. EPA (EPA) has performed a clean-up at the site, residual DDT and dieldrin are still present in the Lauritzen Channel (Figure 1-3).

LRTC has contracted Pacific EcoRisk (PER) to perform sampling and testing of its Berth A sediments in support of the third dredging episode under its current permits. This third episode will consist of "advanced" maintenance dredging activities. The advanced maintenance dredging is being performed to determine if dredging a trench along the face of the Berth A wharf to -45 ft MLLW can decrease the periodicity of maintenance dredging at Berth A. In addition, a secondary advanced maintenance program was also proposed that consisted of dredging of the entire berth area to the permitted over-depth tolerance of -41 ft MLLW. However, sampling and testing was not performed for the secondary advanced maintenance program at this time as the EPA requires more information on the potential effects of advanced maintenance dredging within the entire LRTC Berth A on contaminated sediment migration out of the Lauritzen Canal which is adjacent to the former United Heckathorn Superfund site.

The Berth A permitted maintenance dredge depth is 39 ft below Mean Lower Low Water (-39 ft MLLW) plus a two-foot over dredge tolerance, resulting in a project depth of -41 ft MLLW. Proposed advanced maintenance dredging activities would allow for dredging of a trench along the face of the Berth A wharf to -45 ft MLLW plus a one-foot over-dredge tolerance (-46 ft MLLW). The Episode 3 estimated total volume of dredged material to be removed from Berth A, including material accounted for by the one-foot over dredge tolerance, is estimated at 3,800 cubic yards (yds^3).

Table 1-1. Proposed Episode 3 Dredging for the Levin-Richmond Terminal Corporation.

Area	Dredge Unit	Maintenance Dredging Permitted Depth (ft MLLW)	Over-depth (ft)	Advanced Maintenance Dredging Depth	Estimated Volume (yds^3)	Over-depth (ft)	Estimated Volume (yds^3)	Total Estimated Volume (yds^3)
Berth A Trench	DU1	-39.0	2.0	-45.0	3,500	1.0	330	3,800

This Data Report has been prepared to provide the required characterization of these sediments. In order to meet permit requirements, the area to be dredged was sampled to a total depth of -46 ft MLLW or sampling refusal; a composite sample representative of this area was then analyzed and tested as per the ITM; each of the individual sediment cores was analyzed for organochlorine

pesticides and polychlorinated biphenyls (PCBs). A Z-layer, consisting of the 0.5 ft of sediment immediately below the permitted depth (plus over depth) or sampling refusal depth, was also collected and archived. The Z-layer composite sample was analyzed for organochlorine pesticides and PCBs

1.1 Objectives of the Sediment Investigation

The purpose of the proposed sampling and testing will be to evaluate the proposed dredged material to determine whether it will represent an adverse impact during removal operations and placement at the San Francisco Deep Ocean Disposal Site (SF-DODS). The procedures for sediment sample collection, sample processing and preparation, physical and chemical analyses, and data analyses were presented in a previously approved SAP. The specific objectives of the SAP scope-of-work were as follows:

- Collect core samples from within the designated sampling areas following field protocol detailed in this SAP; and
- Conduct chemical and biological analysis to determine whether Berth A sediment would be suitable for placement at SF-DODS. The results of chemical analysis indicate that sediments would not be suitable for unconfined aquatic disposal (SUAD) at SF-DODS. As a result, only analytical chemistry was performed to determine whether sediments will represent an adverse impact during removal operations and placement at the LRTC rehandling facility prior to placement at a landfill. Samples were archived to provide for any landfill placement site-specific requirements (i.e., waste extraction testing [WET]).

1.2 Organization of this Document

Sample collection and handling procedures are discussed in Sections 2 and 3. Results of chemical analyses are provided in Section 4. Section 5 discusses quality control and Section 6 presents the conclusions regarding sediment suitability.

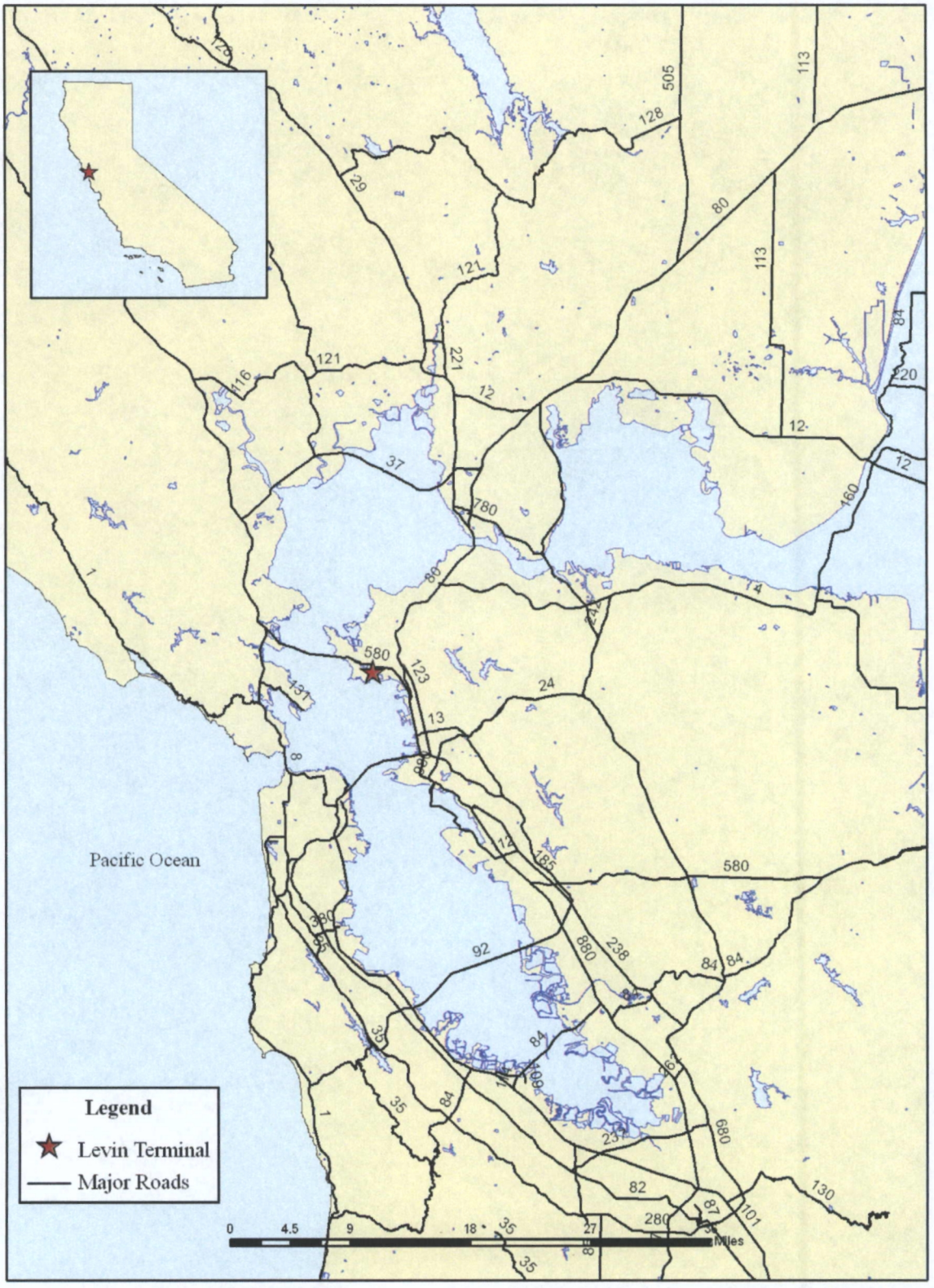

Figure 1-1. Location Map: Levin-Richmond Terminal Corporation

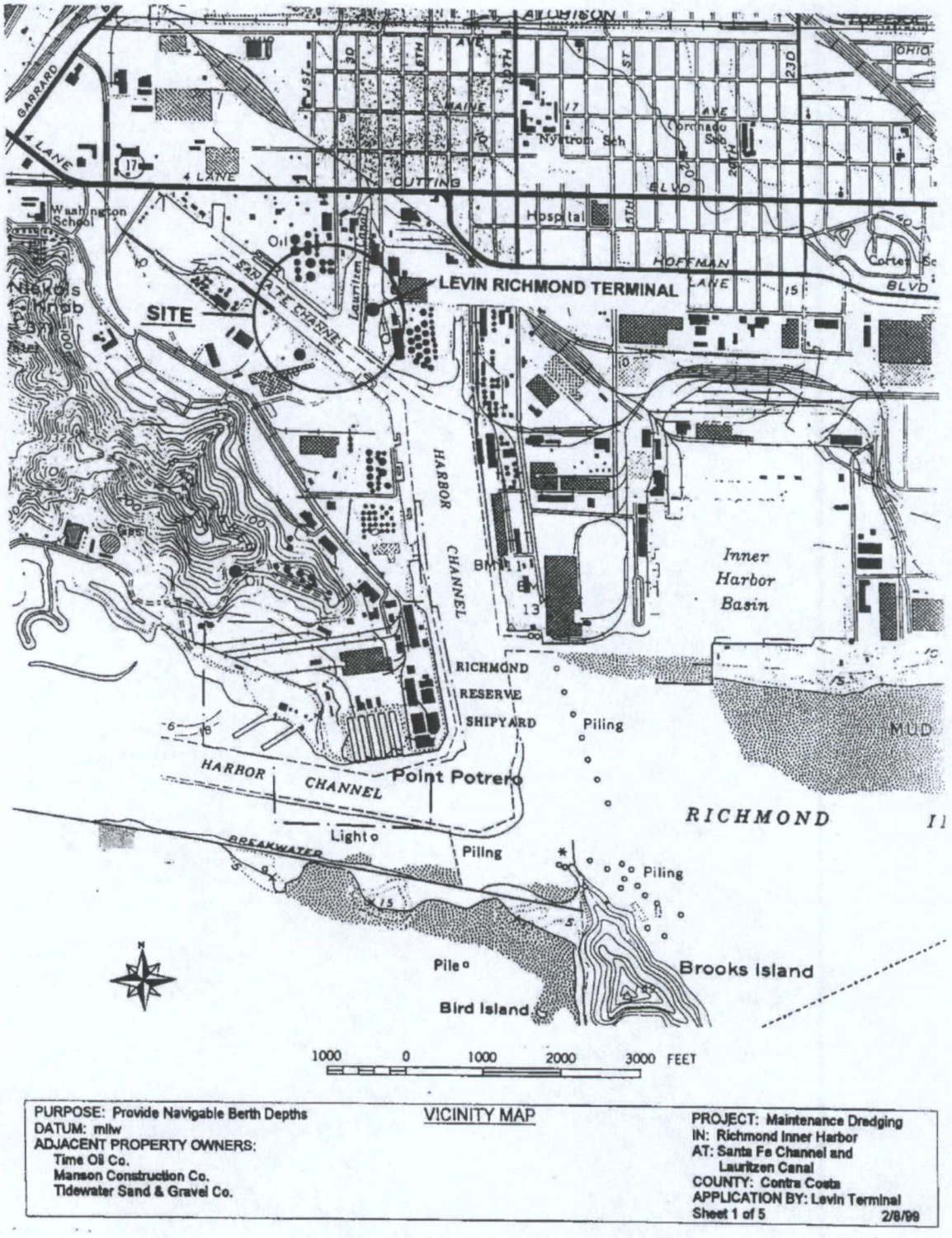

Figure 1-2. Vicinity Map 1: Levin-Richmond Terminal Corporation

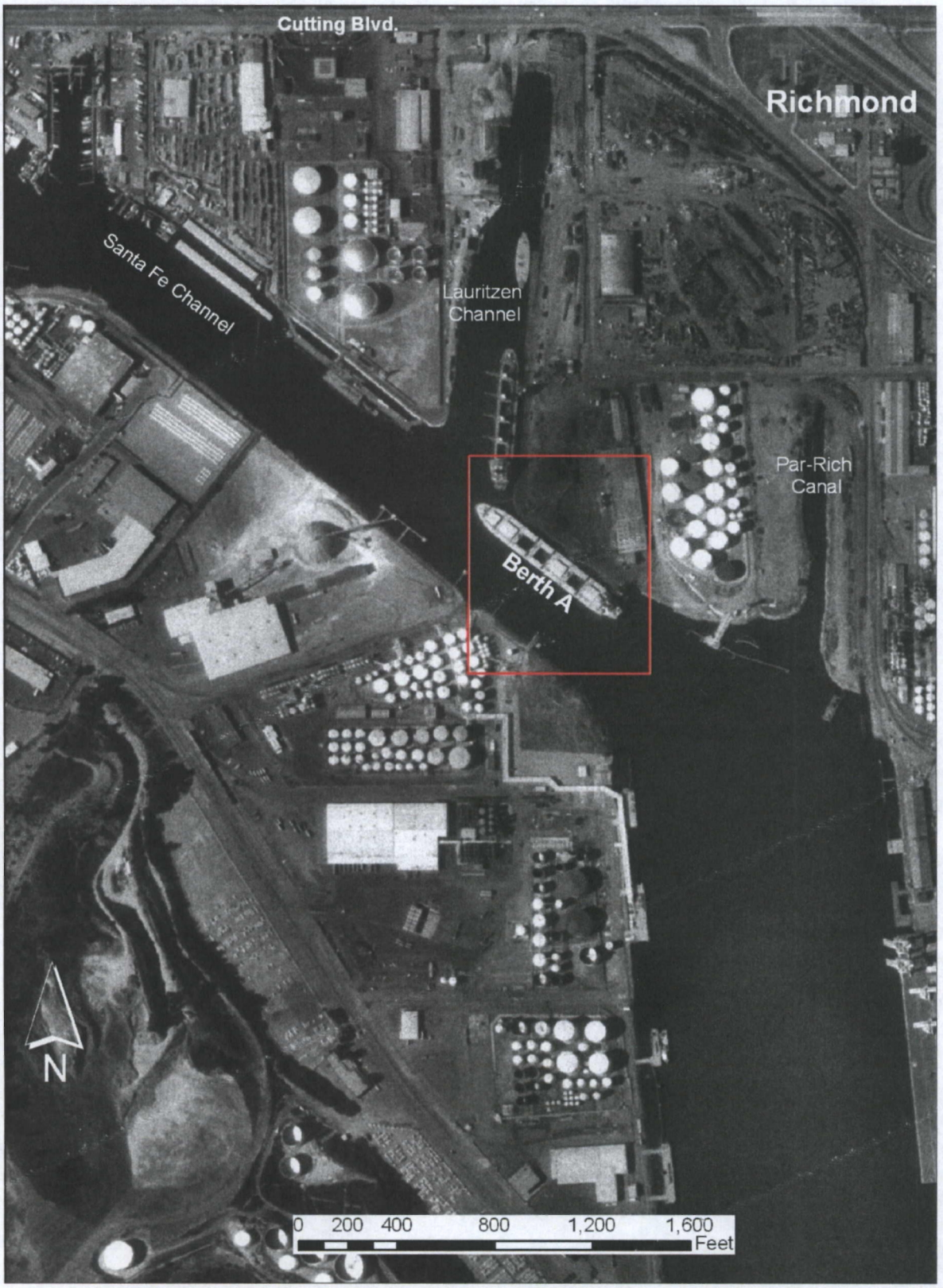

Figure 1-3. Vicinity Map 2: Levin-Richmond Terminal Corporation Berth A

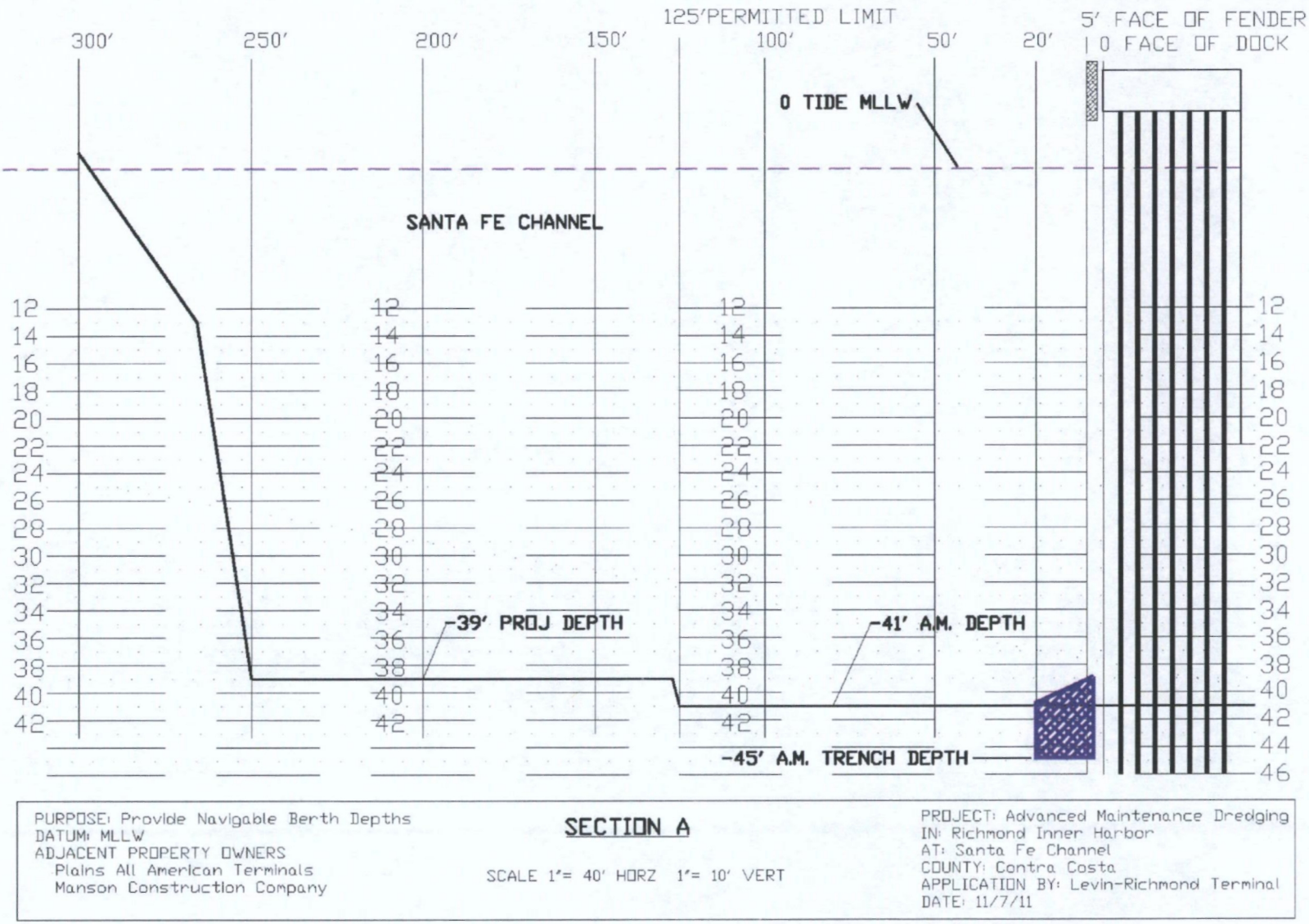

Figure 1-4. Project Map: Levin-Richmond Terminal Berth "A" Cross Section

2. FIELD SEDIMENT SAMPLE COLLECTION

All sediments were collected in accordance with guidelines and procedures outlined in the SAP (PER 2012). All sediment sampling field activities at the LRTC Berth A were performed on May 31, 2012 under the direction of Mr. Jeffrey Cotsifas of Pacific EcoRisk (PER). TEG Oceanographic Services (TEG) provided the sampling vessel, on-board positioning system, and sampling equipment. PER provided additional Field Scientists to assist in sediment core collection. Final sample site positions were determined with a global positioning system (GPS) that uses U.S. Government Wide Angle Augmentation System (WAAS) differential correction data to identify each sampling location. Table 2-1 lists station identifiers, GPS coordinates, mudline elevations, and core penetration depths for all stations.

It should be noted that sample core refusal was observed at each of the proposed sample locations above the 'project depth plus over-depth' of -46 ft MLLW (Table 2-1) due to the presence of hard sand and clay. However, vibracore penetration was achieved near the proposed project depth of -45 ft MLLW for most of the samples. As the project depth + over-depth could not be achieved for each of the samples, the typical Z-layer consisting of the 6-inches of sediment immediately below project depth + over-depth could not be collected. In order to provide characterization of the sediment quality for the sediments that would be in place after dredging of the sediments to the project depth plus over-depth, the bottom 6 inches of a separate core at each sampling location was collected and designated as the Z-layer.

Table 2-1. Locations of Sampling Stations, Core Penetration Depths.

SAMPLE ID	Latitude[A]	Longitude[A]	Mudline Elevation (ft MLLW)	Core Penetration Depth (ft)	Z-Layer (ft)	Cored Depth (ft MLLW)
LRTC-01	37°55.1719'	-122°22.0154'	-41.1	3.0	yes	-44.1
LRTC-02	37°55.1584'	-122°21.9950'	-41.4	4.0	yes	-45.4
LRTC-03	37°55.1395'	-122°21.9686'	-40.6	2.0	yes	-41.9
LRTC-04	37°55.1255'	-122°21.9433'	-40.7	4.2	yes	-44.9
LRTC-05	37°55.1100'	-122°21.9218'	-41.5	3.3	yes	-44.8

[A]State Plane Coordinate System, California Zone 3, NAD 83

All sediment samples were maintained on ice until transported to the PER testing lab for processing. Upon receipt at PER, all samples were logged in and placed in cold storage at ≤4°C in the dark until needed. Field log sheets are presented in Appendix A. With the exception of sampling refusal, there were no other unusual circumstances encountered during the fieldwork, and no major deviations from the SAP (PER 2012).

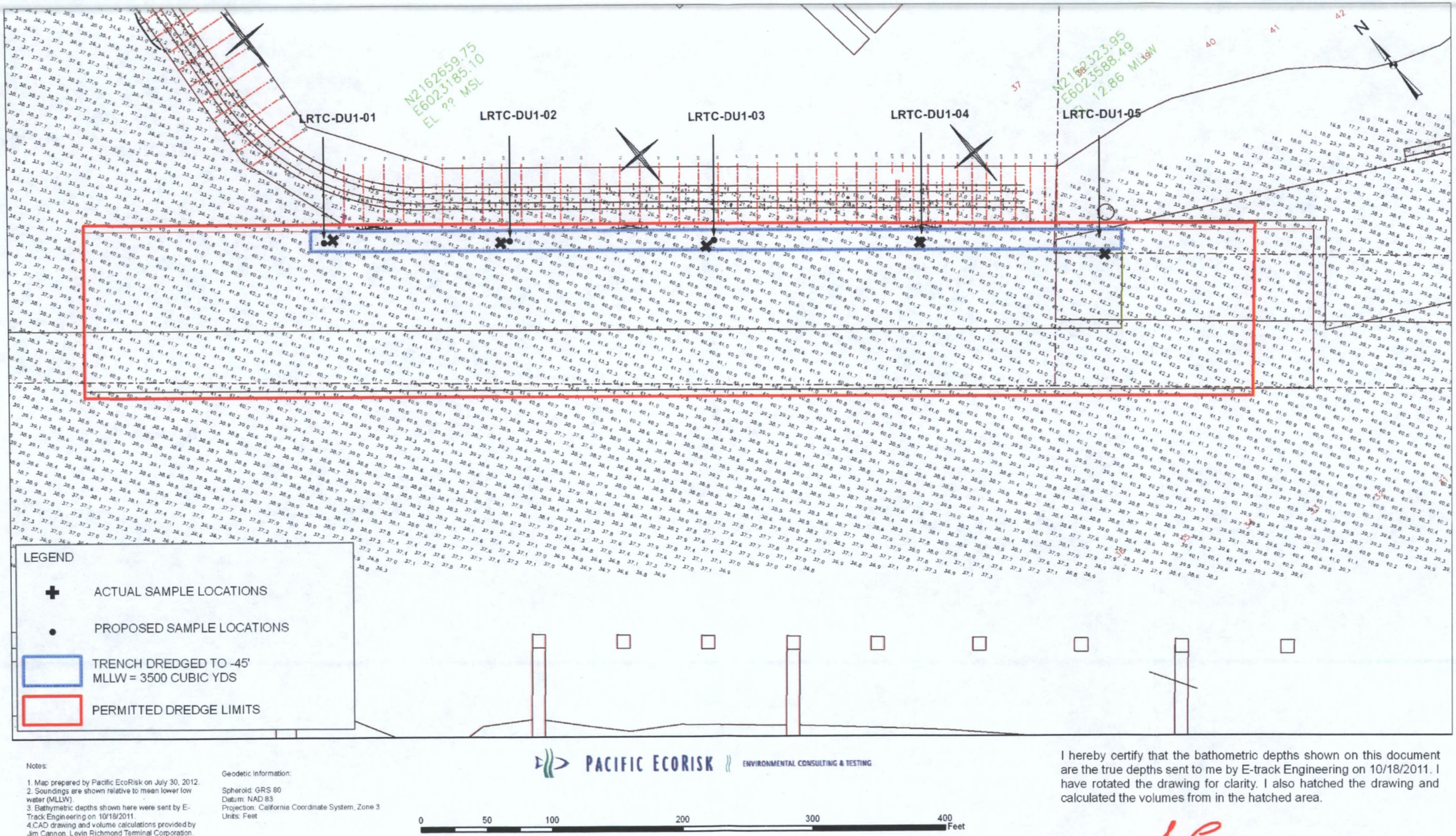

Figure 2-1. Project Map: Levin-Richmond Terminal Berth "A" Sample Locations

3. SAMPLE PROCESSING

3.1 Homogenization and Compositing of Sediments

Homogenization and compositing of individual sediment cores was performed at the PER laboratory facility in Fairfield, CA. The sediment maintenance depth sections from each individual core were individually homogenized in a stainless-steel bowl or high-density polyethylene (HDPE) container. A 500-mL sub-sample of the homogenized sediment from each individual sediment core was archived to allow for additional chemical analyses, if necessary; archived samples will be stored frozen at –20 ± 10°C for up to one [1] year after sample collection.

Proportionate volumes of the individual homogenized maintenance depth core sediments were composited and homogenized within a stainless steel container to comprise the composite sediment for the berth area; the composite sample was designated LRTC-Comp; a sub-sample of the homogenized composite sediment sample was frozen for archival storage.

For the Z-layer sediments, equal volumes of the homogenized LRTC-Z core sediments were composited and homogenized within a stainless steel container to comprise the "LRTC-Z-Comp" composite sediment. A sub-sample of the LRTC-Z-Comp sample was frozen for archival storage as described above.

All sediment was processed following procedures outlined in the SAP (PER 2012), with no deviations.

3.2 Sample Shipping

Prior to shipping to the analytical laboratory, sample containers were wrapped in bubble wrap and securely packed inside a cooler with ice packs or crushed ice. A temperature blank was included in each cooler. The original signed chain-of-custody (COC) forms were placed in a sealed plastic bag and taped to the inside lid of the cooler. Appropriate packaging tape was wrapped completely around the cooler. A *This Side Up* arrow label was attached on each side of the cooler, a *Glass-Handle with Care* label was attached to the top of the cooler, and the cooler was sealed with custody seals on both the front and the back lid seams.

Sediment samples were shipped by overnight delivery. The sub-contracting analytical laboratories are not to dispose of any samples for this project unless notified by PER in writing.

3.2.1 Chain-of-Custody (COC) Protocol

COC procedures were followed for all samples throughout the collection, handling, and analyses activities. The Sampling and Analysis Project Manager, or a designee, was responsible for all sample tracking and COC procedures. This person was responsible for final sample inventory,

maintenance of sample custody documentation, and completion of COC forms prior to transferring samples to the analytical laboratory. A COC form accompanied each cooler of samples to the respective analytical laboratories. Each custodian of the samples signed the COC form; copies of the COC forms are retained in the project file.

4. RESULTS OF CONVENTIONAL AND CHEMICAL ANALYSES

Sediment samples were analyzed by Calscience for the conventional and chemical parameters specified in the SAP (PER 2012). Conventional parameters included total organic carbon (TOC), total solids, and grain size. Chemical analyses included trace metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), chlorinated pesticides, and butyltins. The results of these analyses are presented in Section 4.1; the full Data Report is provided in Appendix B.

Sediment physical and chemical characteristics provide information about chemicals of concern present in the sediment and their potential bioavailability, and about non-chemical factors that could affect toxicity. The results of the physical and chemical analyses of the LRTC Berth A sediments were compared to Bay Ambient sediment concentrations (SFRWQCB 1998) and the SF-DODs reference site database.

The results of the physical/chemical analyses are summarized in Tables 4-1 through 4-6.

4.1 LRTC-Comp Composite Analytical Chemistry Results

The "LRTC-Comp" site sediment was ~46.7% total solids, and was 85.4% fines (silts and clays) and 14.7% sand. TOC levels were moderate (0.64%).

All of the metal analytes for the LRTC-Comp sediments were generally similar to San Francisco Bay background levels (SFRWQCB 1998) and the SF-DODS reference database. Organotins were detected above the method detection limit (MDL) at 12.4 μg/kg. Dieldrin and total DDTs were reported at 4.2 μg/kg and 220 μg/kg, respectively, which were above San Francisco Bay background levels (SFRWQCB 1998) and the SF-DODS database. Total PAHs and total PCBs were reported at 4388 μg/kg and 103.2 μg/kg, respectively. While both total PAHs and total PCBs were above San Francisco Bay background levels (SFRWQCB 1998) and the SF-DODS database, PAHs were slightly below the San Francisco Bay Bioaccumulation Trigger Level (NOAA 2011). The results of the Z-Layer analysis indicated that the post-dredge mudline organochlorine pesticides and PCB concentrations would be expected to be similar or less than the proposed dredged materials.

4.1.1 Results of Analyses of Individual Cores for PCBs and Organochlorine Pesticides

The individual cores that comprised the LRTC-Comp sample were analyzed for PCBs and organochlorine pesticides to determine if there were hot-spot areas along the face of the wharf for these compounds. The results of these analyses indicated that PCB concentrations ranged from 23.6 μg/kg to 72.0 μg/kg, with sediment core LRTC-03 having the highest total PCB concentration. Dieldrin concentrations ranged from 1.7 μg/kg to 4.3 μg/kg, with sediment core LRTC-01 having the highest Dieldrin concentration. Total DDT concentrations ranged from 55.0

μg/kg to 550 μg/kg, with sediment cores LRTC-01 and LRTC-04 having the highest total DDT concentrations.

Table 4-1. LRTC Sediment Grain Size, Total Solids (%), and Total Organic Carbon (%).

Analytes	LRTC-Comp	SF-DODs Database
% Gravel	0.0	16-60
% Sand	14.7	
% Silt	54.2	25-62
% Clay	31.2	13-24
Total % Fines (silt & clay)	85.4	-
Total Solids (%)	46.7	-
Total Organic Carbon (%)	0.64	0.63-1.45

Table 4-2. LRTC Sediment Metals Concentrations (mg/kg, dry wt).

Metals	LRTC-Comp	Bay Ambient <100% Fines[b]	SF-DODS Database
Arsenic	10.3	15.3	2.2-5.33
Cadmium	0.348	0.33	0.3-0.6
Chromium	66.4	112	69.2-283
Copper	65.3	68.1	18.3-86.3
Lead	30.1	43.2	5.1-26
Mercury	0.239	0.43, 0.47[a]	0.1-0.2
Nickel	72.4	112	50.9-238
Selenium	<0.117	0.64	0.6-2.6
Silver	0.332	0.58	0.2-1.0
Zinc	158	158	60.8-288

a - San Francisco Bay 99th percentile mercury concentration (SFRWQCB 2012).
b - SFRWQCB 1998.
J - Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit; the reported value is therefore an estimate.
All results below laboratory method detection limit (MDL) are reported as < the MDL.

Table 4-3 LRTC Sediment Organotin Concentrations (μg/kg, dry wt).

Organotins	LRTC-Comp	Bay Ambient <100% Fines[a]	SF-DODS Database
Butyltin	<1.4	-	-
Dibutyltin	6.1 J	-	-
Tributyltin	6.3 J	-	-
Tetrabutyltin	<1.7	-	-
Total Detected Organotins	**12.4 J**	**-**	**≤1.3**

a - SFRWQCB 1998.
All results below laboratory method detection limit (MDL) are reported as < the MDL.

Table 4-4. LRTC Sediment PAH Concentrations (µg/kg, dry wt).

PAHs	LRTC-Comp	Bay Ambient <100% Fines[b]	SF-DODS Database
Acenaphthene	26	26.6	-
Acenaphthylene	51	31.7	-
Anthracene	110	88	-
Benzo(a)anthracene	280	244	-
Benzo(a)pyrene	320	412	-
Benzo(b)fluoranthene	410	371	-
Benzo(e)pyrene[a]	260	294	-
Benzo(g,h,i)perylene	170	310	-
Benzo(k)fluoranthene	340	258	-
Biphenyl[a]	8.0 J	12.9	-
Chrysene	460	289	-
Dibenzo(a,h)anthracene	50	32.7	-
2,6-Dimethylnaphthalene[a]	31	12.1	-
Fluoranthene	650	514	-
Fluorene	29	25.3	-
Indeno(1,2,3-cd)pyrene	150	382	-
2-Methylnaphthalene[a]	13 J	19.4	-
1-Methylnaphthalene[a]	7.5 J	12.1	-
1-Methylphenanthrene[a]	<3.5	31.7	-
Naphthalene	26	55.8	-
Perylene[a]	90	145	-
Phenanthrene	140	237	-
Pyrene	750	665	-
1,6,7-Trimethylnaphthalene[a]	5.0 J	9.8	-
Dibenzothiophene[a]	12 J	-	-
Total Detected PAHs	**4388**	**3390[b] , 4700[c]**	**≤192**

a - San Francisco Bay additional RMP PAHs (USACE/USEPA 2011).
b - San Francisco Bay ambient PAH Level (SFRWQCB 1998).
c - San Francisco Bay Bioaccumulation Trigger Level (USACE/USEPA 2012).
J - Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit; the reported value is therefore an estimate.
All results below laboratory method detection limit (MDL) are reported as < the MDL.

Table 4-5. LRTC Sediment Organochlorine Pesticide Concentrations (µg/kg, dry wt).

Organochlorine Pesticides	LRTC-Comp	LRTC-01	LRTC-02	LRTC-03	LRTC-04	LRTC-05	LRTC-Z-Comp	Bay Ambient <100% Fines[b]	SF-DODS Database
Aldrin	<0.67	<0.81	<0.74	<0.63	<0.75	<0.64	<0.48	1.1	-
alpha-BHC	<0.69	<0.84	<0.76	<0.65	<0.78	<0.66	<0.49	-	-
beta-BHC	<0.57	<0.68	<0.62	<0.53	<0.63	<0.5	<0.40	-	-
delta-BHC	<0.55	<0.66	<0.60	<0.52	<0.61	<0.52	<0.39	-	-
Total BHC	0.0	<0.89	<0.81	<0.70	<0.83	<0.71	<0.52	0.78, 0.99[a]	-
gamma-BHC (Lindane)	<0.74	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Chlordane	<7.0	<8.4	<7.7	<6.6	<7.8	<6.7	<4.9	1.1, 37[a]	-
Dieldrin	4.2	4.3	2.1 J	3.1	2.5	1.7 J	4.5	0.44, 1.9[a]	-
Endosulfan I	<0.56	<0.68	<0.62	<0.53	<0.63	<0.53	<0.40	-	-
Endosulfan II	<0.60	<0.72	<0.66	<0.56	<0.67	<0.57	<0.42	-	-
Endosulfan Sulfate	<0.72	<0.87	<0.79	<0.68	<0.81	<0.69	<0.51	-	-
Endrin	<0.77	<0.92	<0.84	<0.72	<0.86	<0.73	<0.54	0.78	-
Endrin Aldehyde	<0.52	<0.63	<0.57	<0.49	<0.58	<0.50	<0.37	-	-
Heptachlor	<0.69	<0.83	<0.75	<0.65	<0.77	<0.65	<0.49	-	-
Heptachlor Epoxide	<0.76	<0.92	<0.83	<0.72	<0.85	<0.72	<0.54	-	-
Toxaphene	<14	<16	<15	<13	<15	<13	<9.6	-	-
2,4'-DDD	15	27	4.9	6.5	11	6.4	16	see total DDT	-
4,4'-DDD	110	140	27	34	82	31	86	see total DDT	-
2,4'-DDE	5.9	11	2.9	3.8	3.4	2.3	7.2	see total DDT	-
4,4'-DDE	17	20	7.9	8.1	9.4	5.9	15	see total DDT	-
2,4'-DDT	4.8	3.0	1.9 J	<0.61	4.4	2.4	0.93 J	see total DDT	-
4,4'-DDT	66	42	16	7.2	440	6.8	7.8	see total DDT	-
Total Detected DDT	**220**	**240**	**61**	**59**	**550**	**55**	**130**	**7.0[b], 50[a]**	**≤2.1**

All results below laboratory method detection limit (MDL) are reported as < the MDL.

a - San Francisco Bay Bioaccumulation Trigger Level (USACE/USEPA 2012).

b - SFRWQCB 1998.

J - Analyte was detected at a concentration below the MRL and above the MDL, and therefore is an estimate.

Table 4-6. LRTC Sediment PCB Congener Concentrations (µg/kg, dry wt).

PCBs	LRTC-Comp	LRTC-01	LRTC-02	LRTC-03	LRTC-04	LRTC-05	LRTC-Z-Comp	Bay Ambient <100% Fines[c] (SFRWQCB 1998)	SF-DODS Database
PCB 008	<0.43	<0.52	<0.47	<0.41	<0.48	<0.41	<0.31	-	-
PCB 018	3.5	<0.84	<0.77	1.9	<0.78	<0.67	0.57 J	-	-
PCB 028	2.2	<0.66	<0.60	0.69 J	0.83 J	0.78 J	0.74 J	-	-
PCB 031	5.4	0.90 J	0.49 J	1.1	0.75 J	0.76 J	0.63 J	-	-
PCB 033	1.1	<0.55	<0.50	<0.43	<0.51	0.47 J	0.64 J	-	-
PCB 044	3.9	0.89 J	0.97 J	3.1	1.7	1.0 J	1.3	-	-
PCB 049	6.3	1.0 J	1.3	6.9	1.9	1.6	1.8	-	-
PCB 052	8.4	1.6	2.5	9.1	3.4	2.3	2.9	-	-
PCB 056	<0.34	<0.41	<0.37	<0.32	<0.38	<0.32	<0.24	-	-
PCB 060	<0.68	<0.82	<0.74	<0.64	<0.76	<0.65	<0.48	-	-
PCB 066	4.1	0.81 J	0.81 J	2.3	1.3	1.2	1.5	-	-
PCB 070	4.7	1.2 J	1.9	3.0	1.8	1.4	2.4	-	-
PCB 074	1.8	<0.66	<0.60	0.64 J	1.1 J	0.55 J	0.68 J	-	-
PCB 087	<0.43	<0.52	<0.47	<0.40	<0.48	<0.41	<0.30	-	-
PCB 095	6.4	2.2	3.3	6.2	3.3	2.3	3.8	-	-
PCB 097	3.1	1.0 J	1.8	2.1	1.6	0.67 J	2.5	-	-
PCB 099	6.9	2.1	2.7	5.1	3.8	2.0	3.3	-	-
PCB 101	12	4.3	6.2	7.8	5.5	4.4	13	-	-
PCB 105	2.2	<0.62	1.7	1.0	0.93 J	0.72 J	1.7	-	-
PCB 110	7.8	1.8	4.0	5.8	3.0	2.0	4.7	-	-
PCB 118	8.4	1.8	4.3	5.3	2.9	2.0	4.7	-	-
PCB 128	1.7	<0.63	0.97 J	0.83 J	0.74 J	<0.50	1.1	-	-
PCB 132	<0.53	<0.64	<0.58	<0.50	<0.59	<0.50	<0.38	-	-
PCB 138/158	<0.54	<0.64	<0.59	<0.50	<0.60	<0.51	<0.38	-	-
PCB 141	1.2	0.56 J	0.88 J	0.66 J	0.51 J	0.51 J	0.75 J	-	-
PCB 149	4.6	1.2 J	2.3	3.0	2.2	1.6	2.9	-	-
PCB 151	<0.35	<0.43	<0.39	<0.33	<0.40	<0.34	<0.25	-	-
PCB 153	<0.47	1.0 J	2.2	3.1	<0.53	1.6	2.4	-	-

Table 4-6 (*Continued*). LRTC Sediment PCB Congener Concentrations (µg/kg, dry wt).

PCBs	LRTC-Comp	LRTC-01	LRTC-02	LRTC-03	LRTC-04	LRTC-05	LRTC-Z-Comp	Bay Ambient <100% Fines[c]	SF-DODS Database
PCB 156	0.93 J	<0.58	<0.53	<0.45	<0.54	<0.46	0.55 J	-	-
PCB 170	<0.54	<0.64	<0.59	0.51 J	<0.60	<0.51	0.81	-	-
PCB 174	0.93 J	<0.49	<0.45	0.40 J	<0.46	0.57 J	0.61 J	-	-
PCB 177	0.60 J	<0.62	<0.56	<0.48	<0.57	<0.49	0.37 J	-	-
PCB 180	2.1	1.2 J	0.87 J	0.91 J	1.1 J	1.1	1.5	-	-
PCB 183	0.91 J	<0.56	0.56 J	<0.44	0.63 J	0.54 J	0.68 J	-	-
PCB 187	1.0 J	<0.56	<0.51	0.52 J	0.79 J	0.59 J	1.1	-	-
PCB 194	0.57 J	<0.61	<0.55	<0.48	<0.57	<0.48	0.37 J	-	-
PCB 195	<0.47	<0.57	<0.52	<0.45	<0.53	<0.45	<0.33	-	-
PCB 201	<0.47	<0.56	<0.51	<0.44	<0.52	<0.44	<0.33	-	-
PCB 203	0.45 J	<0.52	<0.47	<0.40	<0.48	<0.41	<0.30	-	-
Total Detected PCBs	**103.2**	**23.6**	**39.8**	**72.0**	**39.8**	**30.7**	**60**	**21.6, 26.4[a] 17.0[b]**	**Not detected**

a - San Francisco Bay 99th percentile PCB concentration (SFRWQCB 2012).
b - San Francisco Bay Bioaccumulation Trigger Level (USACE/USEPA 2012).
c - SFRWQCB 1998.
J - Analyte was detected at a concentration below the MRL and above the MDL, and therefore is an estimate.
All results below laboratory method detection limit (MDL) are reported as < the MDL.

5. QUALITY CONTROL REVIEW

Any analyses that did not comply with the analytical laboratory QA/QC limits are presented below (also, see final analytical reports in Appendix B for full case narrative).

5.1 Sediment Conventional and Chemical Analytical QA/QC Summary

The QA/QC review entailed reviewing the contract lab Data Report(s) for sample integrity, correct methodology, and compliance with all appropriate Lab QA/QC requirements. The overall data quality assessment found that all data were usable. Appendix B contains the conventional and chemical analyses reports, which include contract laboratory QA/QC narratives.

Metals – The matrix spike recoveries for lead and zinc fell outside the established control limits due to matrix interference. However, the results were flagged with the appropriate qualifiers and released with no further qualification since the laboratory control sediment/ laboratory control sediment duplicate (LCS/LCSD) recoveries were within the established control limits.

Organochlorine Pesticides – The matrix spike (MS), matrix spike duplicate (MSD), and/or relative percent difference (RPD) values for three organochlorine pesticides were outside the control limits due to matrix interference. The results were flagged with the appropriate qualifiers and were released with no further action since the associated LCS/LCSD recoveries and RPDs were within method control limits.

PCB Congeners – Many of the matrix spice and matrix spike recoveries fell outside the control limits due to matrix interference. However, since the LCS/LCSD recoveries were within the established control limits, the data were released with no further qualification.

Organotins – The Tributyltin MSD recovery and relative percent difference (RPD) were above the control limits. However, the LCS and LCSD recoveries and RPDs were in control, therefore the results were released with no further action.

PAHs –Several PAHs were measured in the method blank above the method detection limit, but below the reporting limit. Several PAH analytes were outside the established control limits due to the PAH concentrations found in the sample. The results were qualified and are released with no further action since the LCS and LCSD recoveries are in control.

6. SUMMARY

The Levin Richmond Terminal Sediments were analyzed to determine to determine suitability for placement at SF-DODS, or at the LRTC rehandling facility prior to disposal at a landfill.

The results of chemical analysis suggest that sediments would not be suitable for unconfined aquatic disposal (SUAD) at SF-DODS due to elevated total DDT; biological testing was not performed. As a result, LRTC is seeking a suitability determination to allow for dredging and placement of dredged material at a temporary on-site rehandling facility. Once the sediments are dried to an acceptable moisture level, they would be transported to a landfill. Samples have been archived to provide for any landfill placement site-specific requirements (i.e., waste extraction testing [WET]).

7. REFERENCES

PER (2012) Sediment Characterization Sampling and Analysis Plan (SAP) for the Dredging of Sediment from the Levin Richmond Terminal Berth. Prepared for Levin Richmond Terminal Corporation. Prepared by Pacific EcoRisk, Fairfield, CA.

SFRWQCB (1998) Ambient concentrations of toxic chemicals in San Francisco Bay Sediments: Draft Staff Report. San Francisco Regional Water Quality Lab Control Board, Oakland, CA.

USEPA/USACE (1998) Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual – Inland Testing Manual. U.S. Environmental Protection Agency/U.S. Army Corps of Engineers. EPA-823-B-94-002. U.S. Environmental Protection Agency, Office of Water (4305).

see SDMS # 2374717